A Presentation to the
Facilities Disposition and Site Remediation Committee
Savannah River Site
Citizens Advisory Board

Annual Remedial Actions Update Along Fourmile Branch

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Acronyms

1pCi/L	one picocurie per liter
1pCi/mL	one picocurie per milliliter
40Km	40 kilometers
I-129	Iodine
Cs 137	Cesium-137
mrem/yr.	millirem per year
pH	acidity indicator
Sr-90	Strontium-90
MWMF	Mixed Waste Management Facility
ORWBG	Old Radioactive Waste Burial Ground
RCRA	Resource Conservation and Recovery Act
SRS	Savannah River Site
VOCs	Volatile Organic Compounds

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Purpose

- **To provide the Citizen Advisory Board's Facilities Disposition and Site Remediation Committee an update on remediation progress along Fourmile Branch**

Groundwater and Surface Water Quality Goals

- **Protect the water quality of the Savannah River**
  - **Downstream drinking water source**
    - **No downstream drinking water or ecological issues**
- **Currently performing three Corrective Actions on Groundwater adjacent to Fourmile Branch**
  - **RCRA Permit Goals include:**
    - **70% reduction in tritium flux to Fourmile Branch (onsite stream)**
    - **Reduce all other constituents to below standards in Fourmile Branch and seeplines along the Branch**

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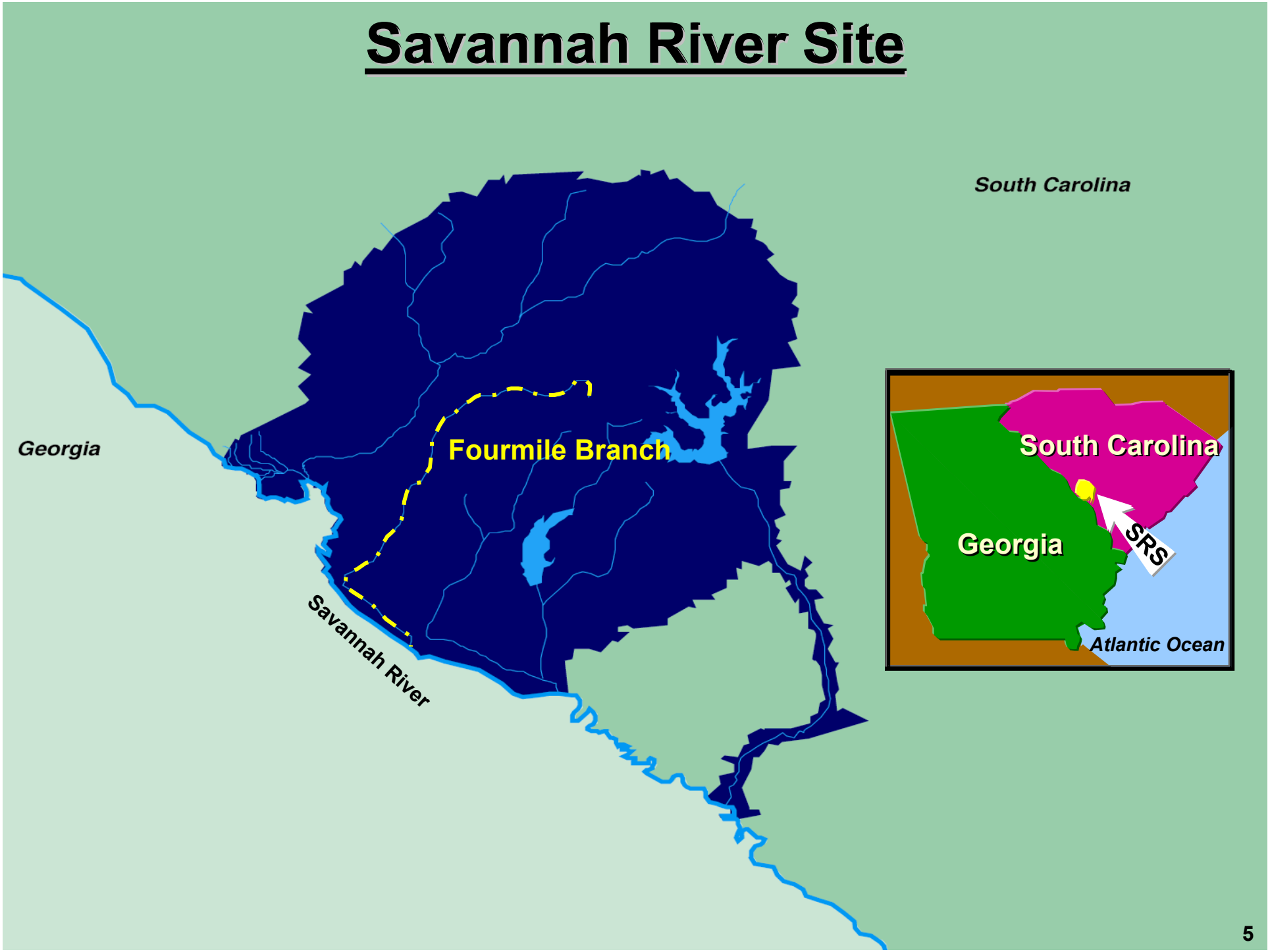
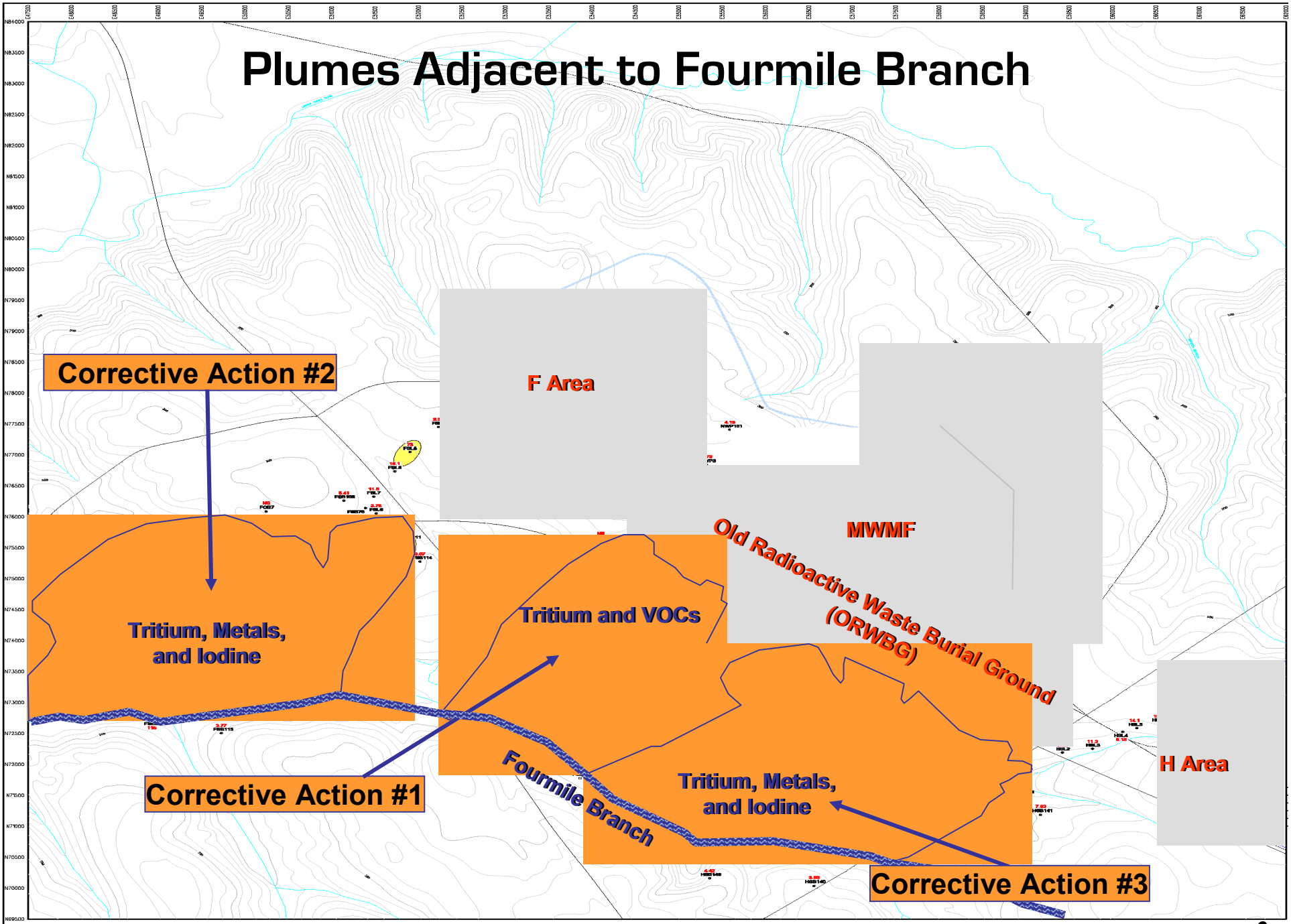
Savannah River Site



Plumes Adjacent to Fourmile Branch



Map 12A. GSA Corrective Action Report. Tritium Concentrations in the Upper Aquifer Zone of the Upper Three Runs Aquifer at the GSA, First Quarter 2007

Corrective Action #1

- **Source**:
  - Old Radioactive Waste Burial Ground
- **Effect on Fourmile Branch**:
  - Tritium and Volatile Organic Compounds (VOCs) outcropped to surface and flowed to Fourmile Branch
- **Remediation**:
  - 76-acre cap placed on ORWBG to manage rainwater infiltration
  - Water capture (dam) with irrigation
  - Dissipates tritium and VOCs

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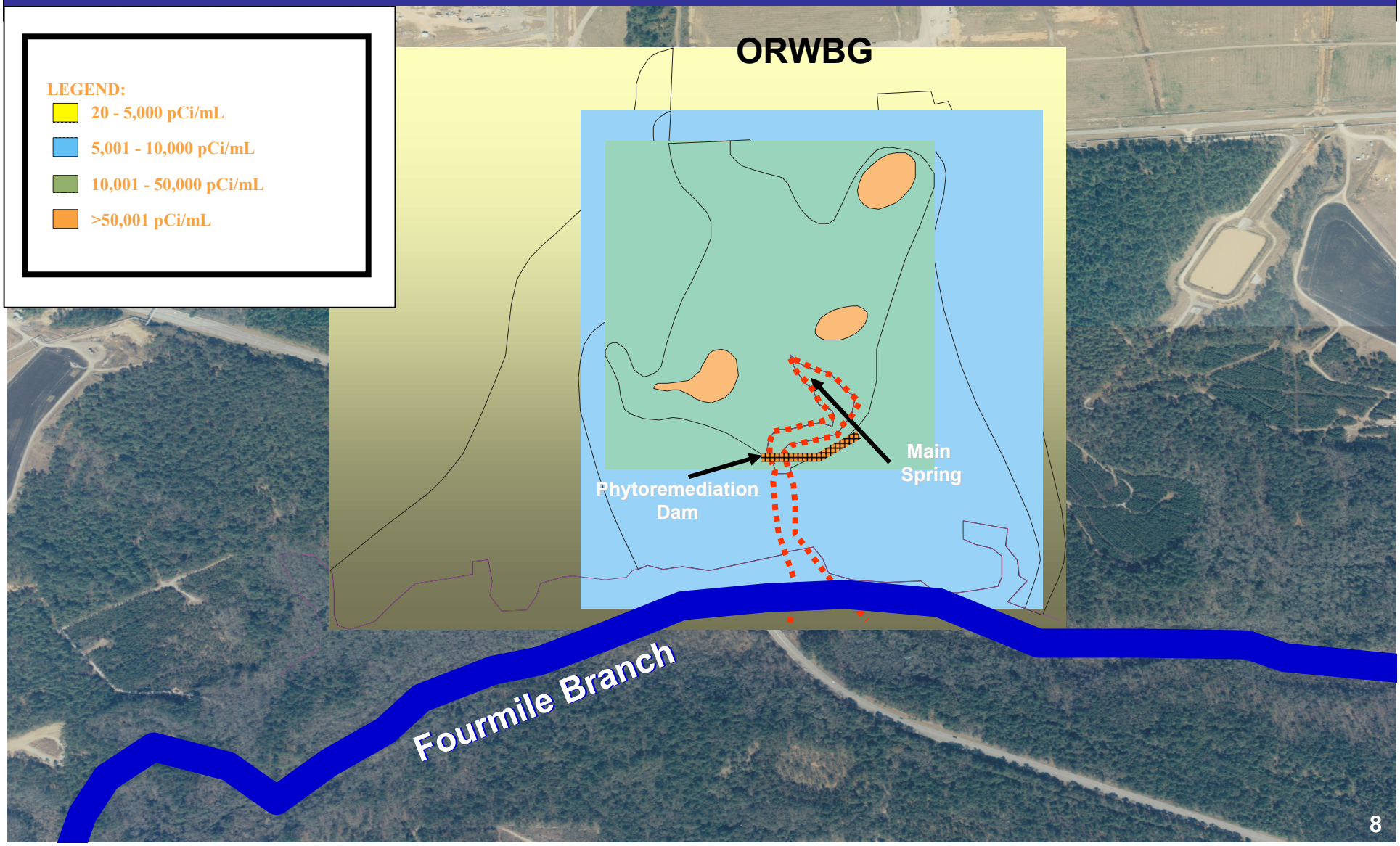
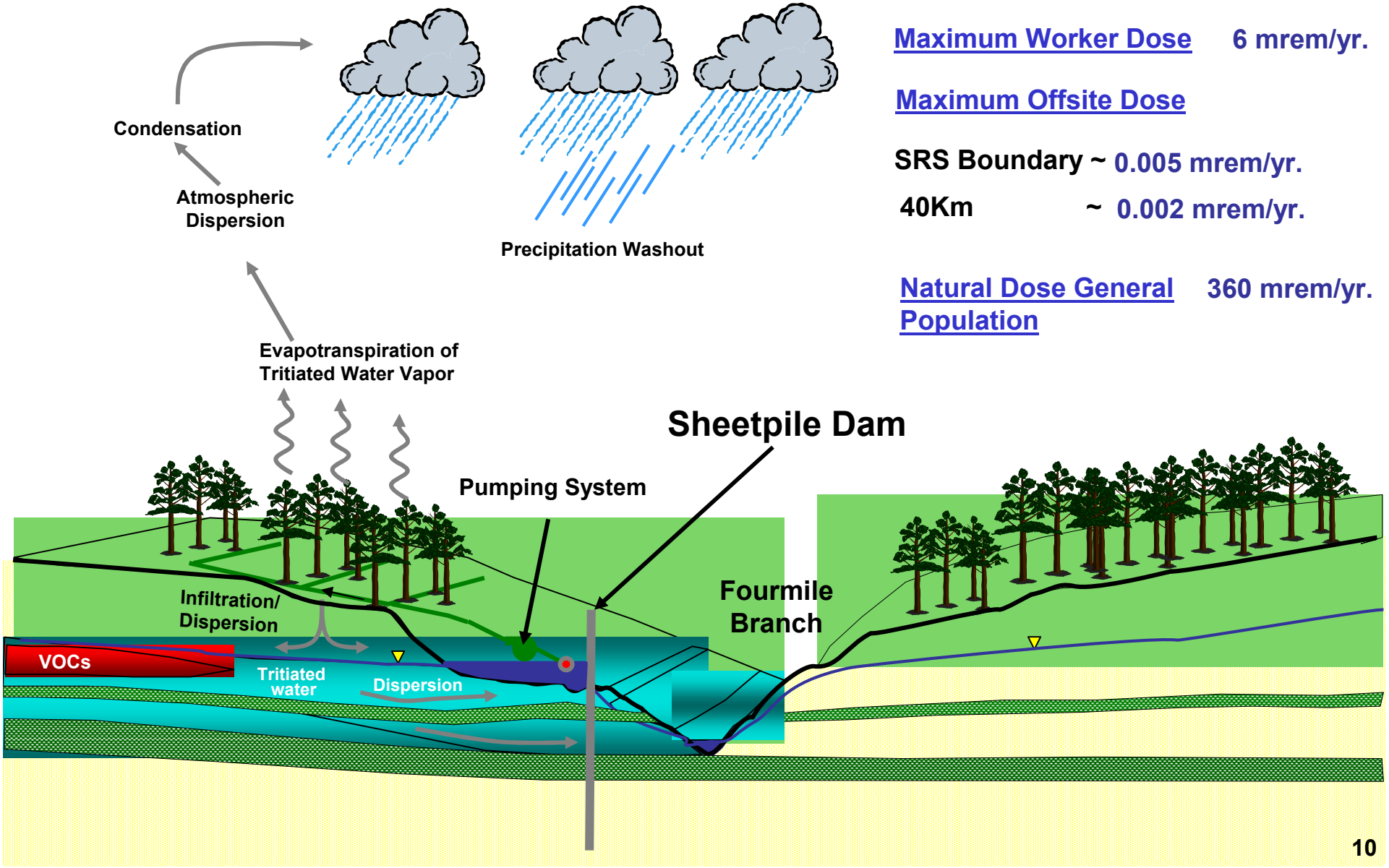
Southwest Plume



Remediation – Capture System

Mixed Waste Management Facility – Phytoremediation Dam

Phytoremediation System



Release to Environment / Dose to People

Maximum Worker Dose 6 mrem/yr.

Maximum Offsite Dose

SRS Boundary ~ 0.005 mrem/yr.

40Km ~ 0.002 mrem/yr.

Natural Dose General Population 360 mrem/yr.

Remediation Effectiveness

- ORWBG Cap installed August 2007
- Phytoremediation System operated since 2000
- Concentration of tritium in Fourmile Branch has been reduced approximately 70%; VOCs degraded
- No issues with the system have been identified
- Irrigation system expansion to improve water management is underway

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Corrective Actions #2 and #3

- **Source**:
  - F and H Seepage Basins
- **Effect on Fourmile Branch**:
  - Low pH waste waters previously placed in basins resulted in plumes containing radionuclides (metallic and non-metallic)
- **Remediation**:
  - F Base injection – expanding to include H Area
  - F&H Barrier system – expanding system in F Area
  - Silver injection to manage I-129 – development underway / deployment being planned
    - Field testing indicates large reductions (50%) in iodine in the groundwater after treatment

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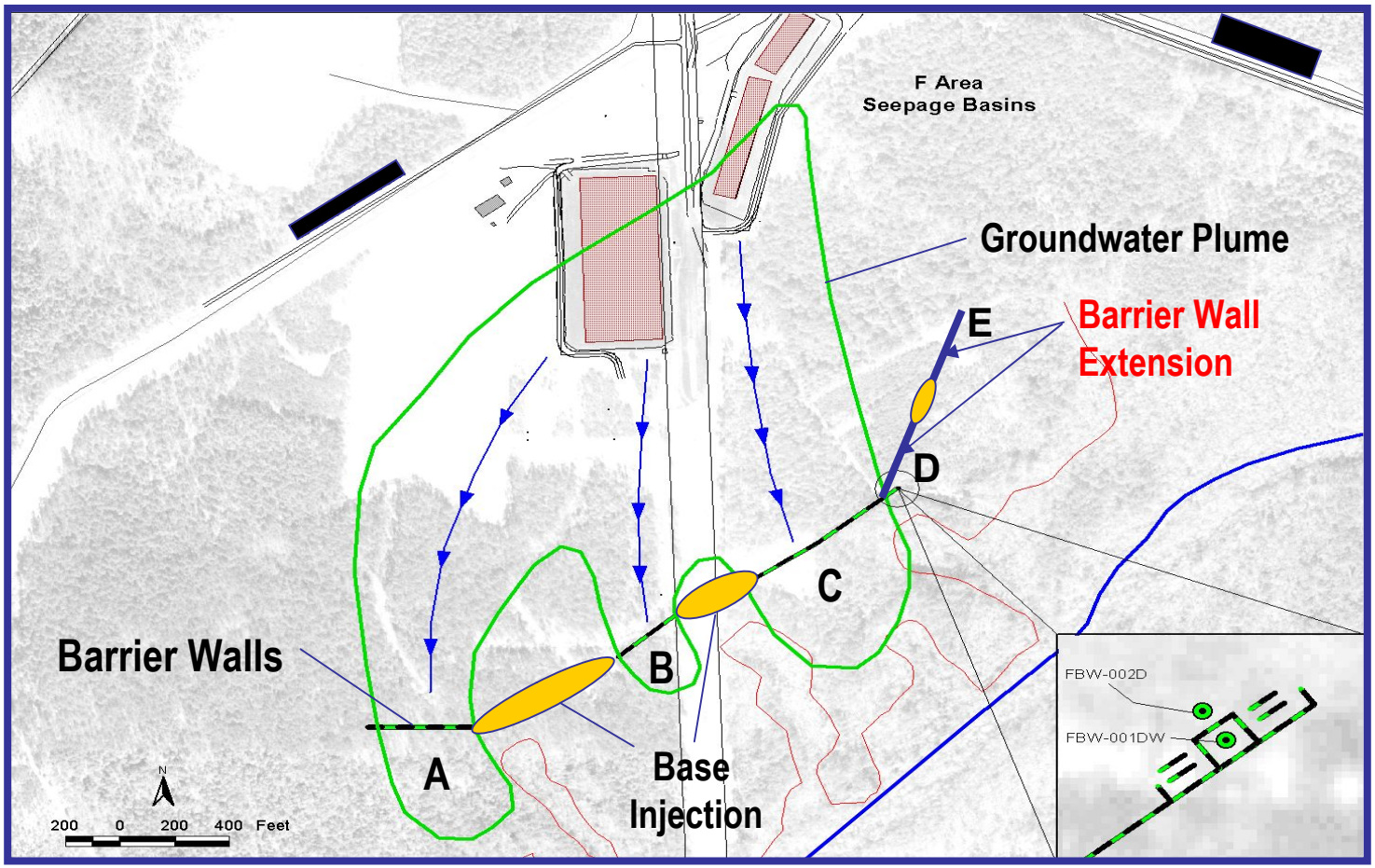
F-Seepage Basin Barrier Extension



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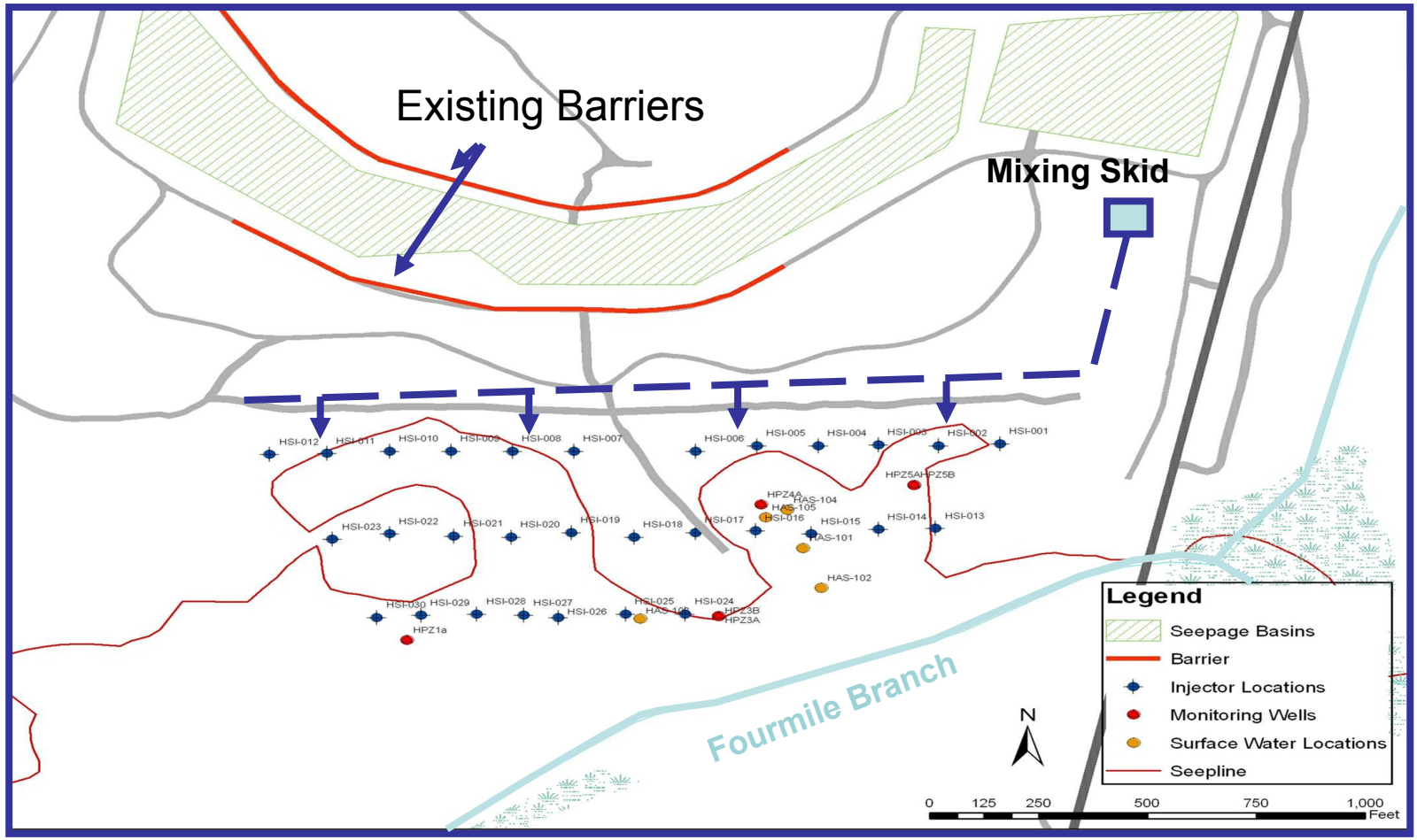
Existing H-Seepage Basin Barriers and New Base Injection System



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Remediation Effectiveness

- Seepage basins capped early 1990s
- Barrier systems installed 2004, (with base injection at F Barrier)
  - Base Injection – effective at reducing metals in groundwater that effect Fourmile Branch (principally Cs 137 and Sr 90)
  - F/H Barrier Walls - 70% reduction in tritium flux to Fourmile Branch achieved (one of the 2a goals), significant reductions in Sr-90 in the branch
  - Iodine 129 is not treated with base injection, new silver injection technology is proposed
- No issues with the system have been identified

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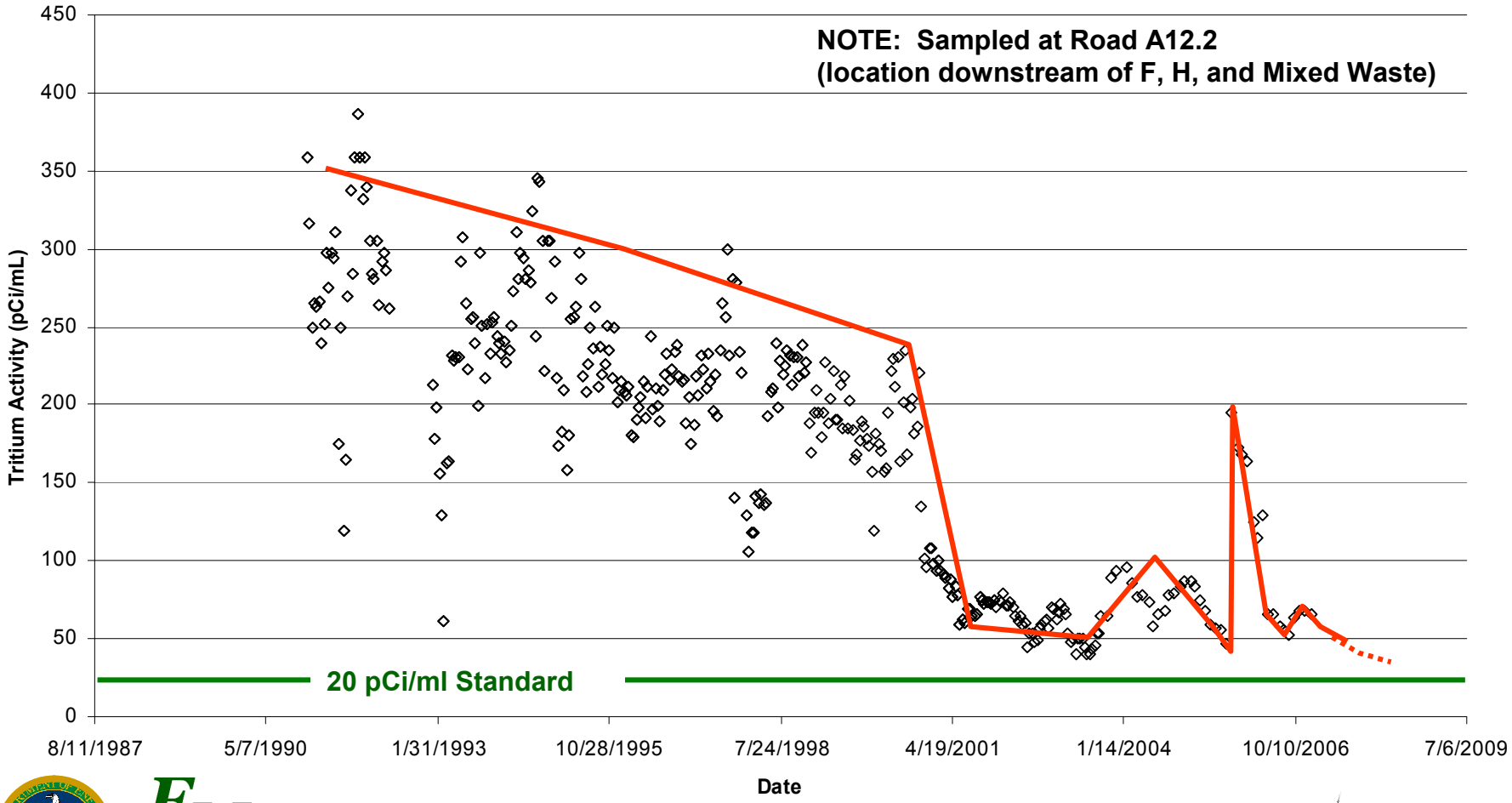
Remedial Effectiveness of Combined Corrective Actions in Tritium Reduction at Fourmile Branch



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Conclusions

- **Remedial efforts have been extremely effective**
- **We are capitalizing on opportunities for improvement:**
  - **Additional base injection**
  - **Barrier Wall extension**
  - **Silver injection**

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